



80V 2.9mΩ N-Ch Power MOSFET

Features

- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% R_g Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

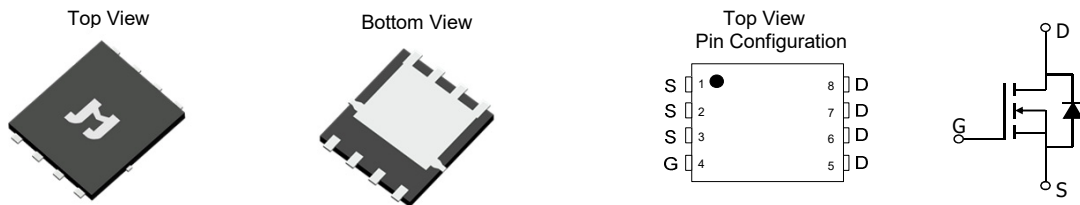
Product Summary

| Parameter | Typ. | Unit |
|--|------|------|
| V_{DS} | 80 | V |
| $V_{GS(th)}$ | 2.8 | V |
| I_D (@ $V_{GS} = 10V$) ⁽¹⁾ | 144 | A |
| $R_{DS(ON)}$ (@ $V_{GS} = 10V$) | 2.9 | mΩ |

Applications

- Power Management in Telecom., Industrial Automation, CE
- Motor Driving in Power Tool, E-vehicle, Robotics
- Current Switching in DC/DC & AC/DC (SR) Sub-systems

PDFN5x6-8L

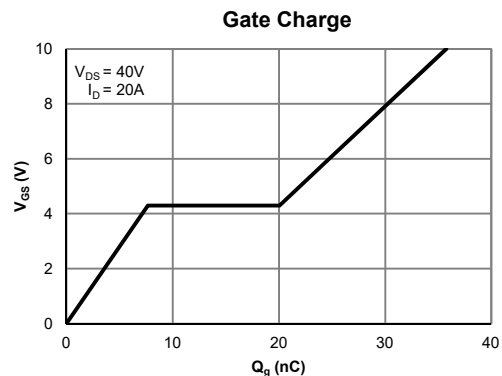
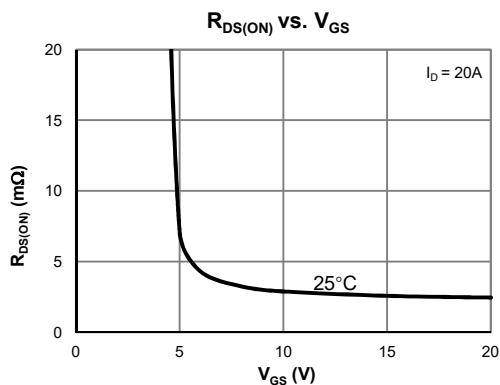


Ordering information

| Device | Package | # of Pins | Marking | MSL | T_J (°C) | Media | Quantity (pcs) |
|----------------|------------|-----------|---------|-----|------------|--------------|----------------|
| JMSH0803AGS-13 | PDFN5x6-8L | 8 | H0803AS | 1 | -55 to 150 | 13-inch Reel | 3000 |

Absolute Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|----------------|--------------------|------|
| Drain-to-Source Voltage | V_{DS} | 80 | V |
| Gate-to-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | $T_C = 25^\circ C$ | 144 |
| | | $T_C = 70^\circ C$ | 115 |
| Pulsed Drain Current ⁽²⁾ | I_{DM} | 500 | A |
| Avalanche Current ⁽³⁾ | I_{AS} | 73 | A |
| Avalanche Energy (@ $L = 0.1mH$) ⁽³⁾ | E_{AS} | 266 | mJ |
| Power Dissipation ⁽⁴⁾ | P_D | $T_C = 25^\circ C$ | 139 |
| | | $T_C = 70^\circ C$ | 89 |
| Junction & Storage Temperature Range | T_J, T_{STG} | -55 to 150 | °C |





Electrical Characteristics (@ T_J = 25°C unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|-----------------------------------|----------------------|--|------|------|------|------|
| STATIC PARAMETERS | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | I _D = 250μA, V _{GS} = 0V | 80 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 64V, V _{GS} = 0V T _J = 55°C | | | 1 | μA |
| | | | | | 5 | |
| Gate-Body Leakage Current | I _{GSS} | V _{DS} = 0V, V _{GS} = ±20V | | | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 2.0 | 2.8 | 4.0 | V |
| Static Drain-Source ON-Resistance | R _{DS(ON)} | V _{GS} = 10V, I _D = 20A | | 2.9 | 3.6 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} = 5V, I _D = 20A | | 78 | | S |
| Diode Forward Voltage | V _{SD} | I _S = 1A, V _{GS} = 0V | | 0.7 | 1.0 | V |
| Diode Continuous Current | I _S | T _C = 25°C | | | 139 | A |

| | | | | | | |
|--|------------------|---|--|------|--|----|
| DYNAMIC PARAMETERS ⁽⁵⁾ | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0V, V _{DS} = 40V, f = 1MHz | | 2107 | | pF |
| Output Capacitance | C _{oss} | | | 1624 | | pF |
| Reverse Transfer Capacitance | C _{rss} | | | 19 | | pF |
| Gate Resistance | R _g | V _{GS} = 0V, V _{DS} = 0V, f = 1MHz | | 2.0 | | Ω |

| | | | | | | |
|--|---------------------|--|--|------|--|----|
| SWITCHING PARAMETERS ⁽⁵⁾ | | | | | | |
| Total Gate Charge (@V _{GS} = 10V) | Q _g | V _{GS} = 0 to 10V, V _{DS} = 40V, I _D = 20A | | 35.8 | | nC |
| Total Gate Charge (@V _{GS} = 6V) | Q _g | | | 24.7 | | nC |
| Gate Source Charge | Q _{gs} | | | 7.7 | | nC |
| Gate Drain Charge | Q _{gd} | | | 12.4 | | nC |
| Turn-On DelayTime | t _{D(on)} | V _{GS} = 10V, V _{DS} = 40V R _L = 2Ω, R _{GEN} = 6Ω | | 10.4 | | ns |
| Turn-On Rise Time | t _r | | | 14.5 | | ns |
| Turn-Off DelayTime | t _{D(off)} | | | 31.5 | | ns |
| Turn-Off Fall Time | t _f | | | 20.3 | | ns |
| Body Diode Reverse Recovery Time | t _{rr} | I _F = 20A, dI _F /dt = 100A/μs | | 62 | | ns |
| Body Diode Reverse Recovery Charge | Q _{rr} | I _F = 20A, dI _F /dt = 100A/μs | | 126 | | nC |

Thermal Performance

| Parameter | Symbol | Typ. | Max. | Unit |
|---|------------------|------|------|------|
| Thermal Resistance, Junction-to-Ambient | R _{θJA} | 50 | 65 | °C/W |
| Thermal Resistance, Junction-to-Case | R _{θJC} | 0.7 | 0.9 | °C/W |

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J_Max} = 150°C.
3. This single-pulse measurement was taken under the following condition [L = 0.1mH, V_{GS} = 10V, V_{DD} = 40V] while its value is limited by T_{J_Max} = 150°C.
4. The power dissipation PD is based on T_{J_Max} = 150°C.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

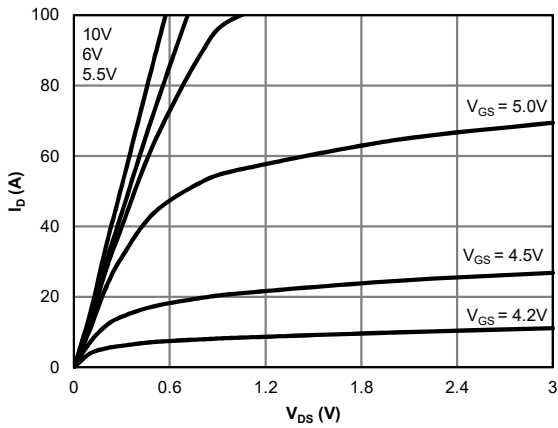


Figure 1: Saturation Characteristics

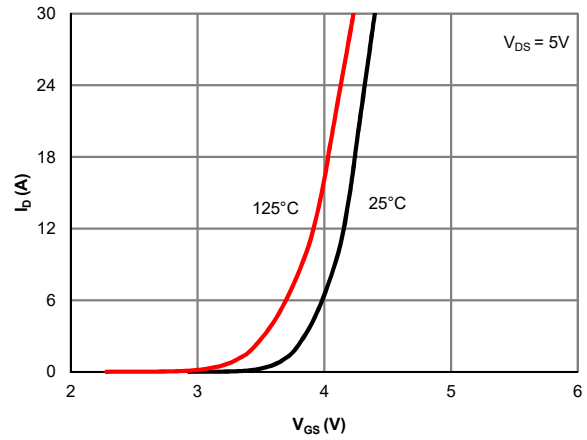


Figure 2: Transfer Characteristics

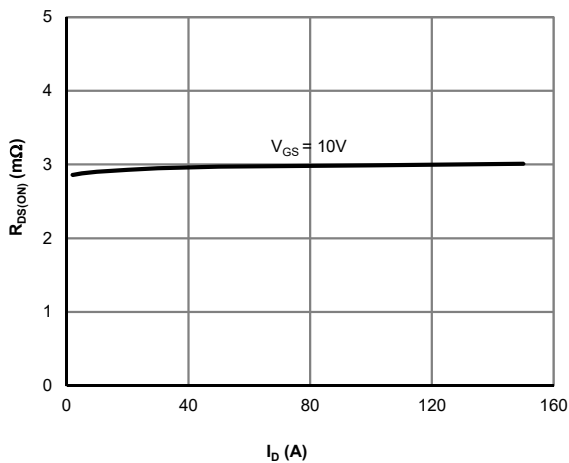


Figure 3: $R_{DS(ON)}$ vs. Drain Current

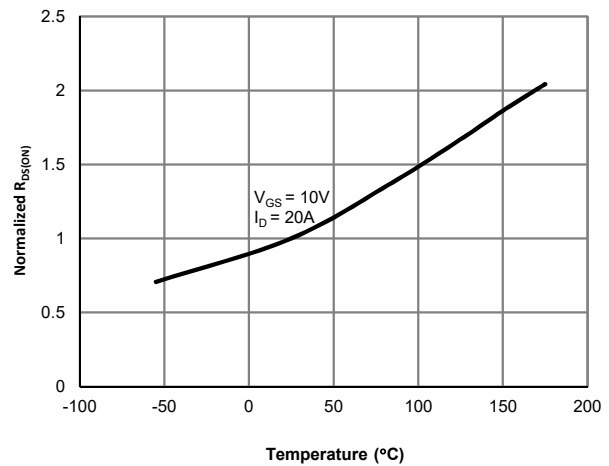


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

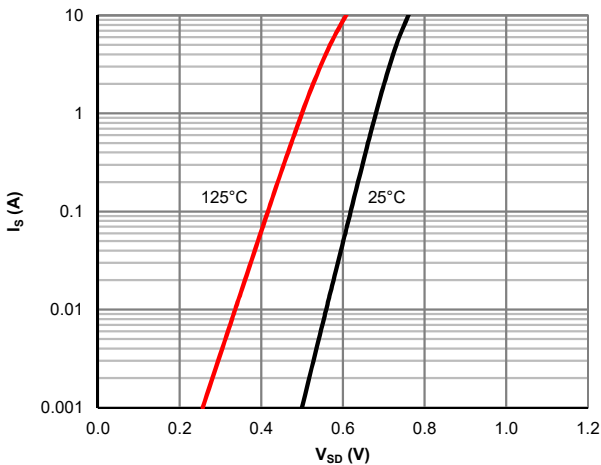


Figure 5: Body-Diode Characteristics

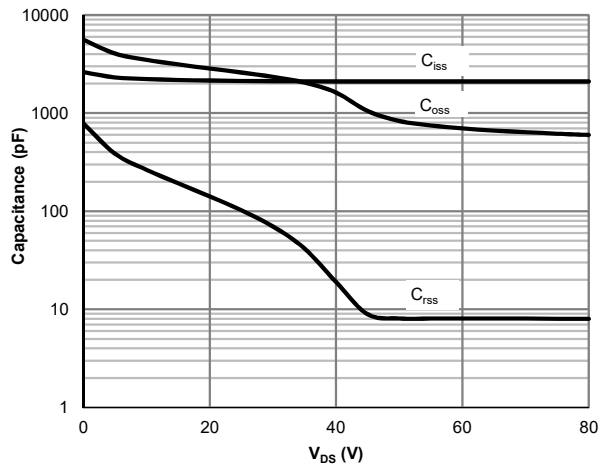


Figure 6: Capacitance Characteristics



Typical Electrical & Thermal Characteristics

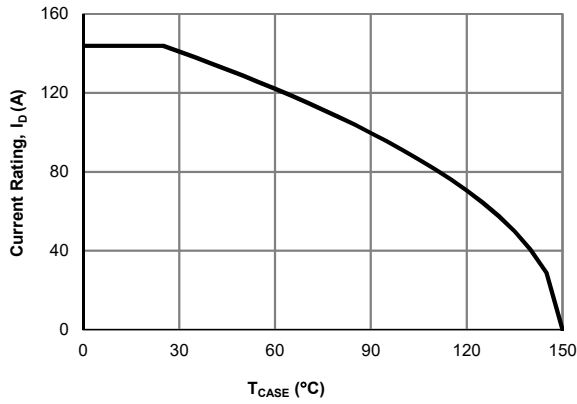


Figure 7: Current De-rating

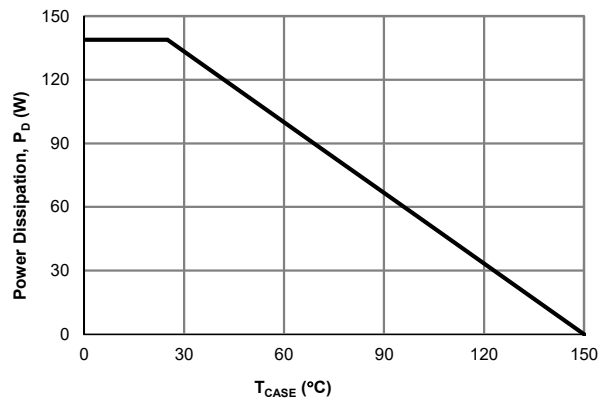


Figure 8: Power De-rating

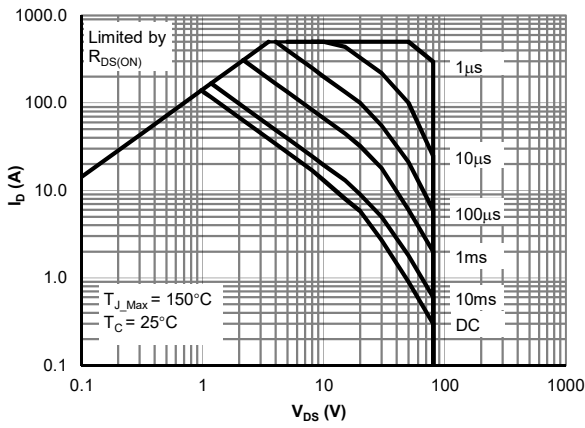


Figure 9: Maximum Safe Operating Area

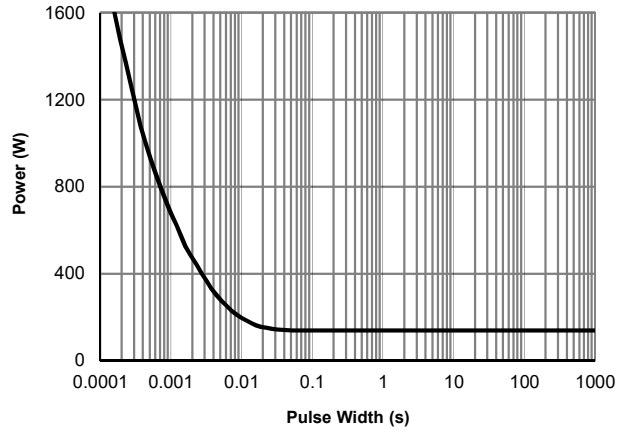


Figure 10: Single Pulse Power Rating, Junction-to-Case

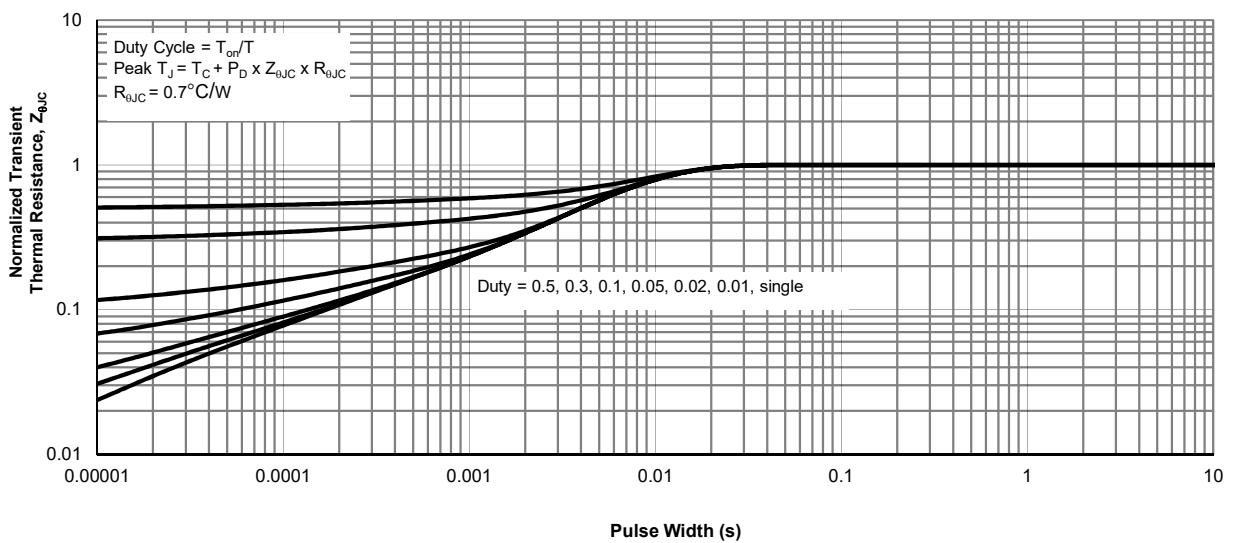
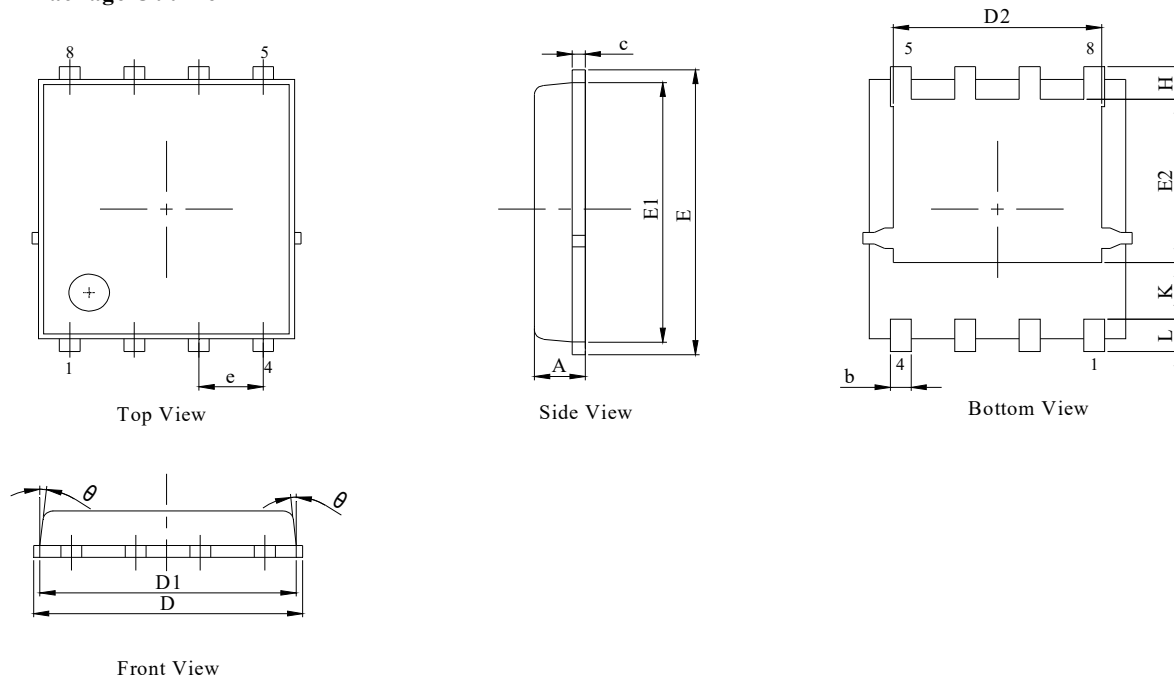


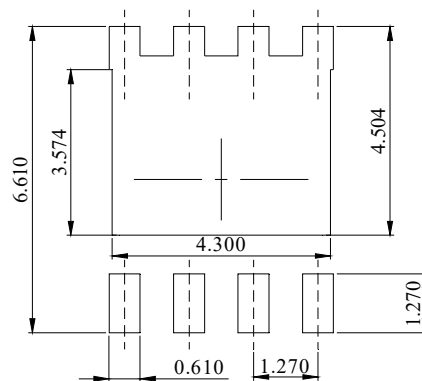
Figure 11: Normalized Maximum Transient Thermal Impedance

PDFN5x6-8L Package Information (All units in mm)

Package Outline

NOTES:

1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle in degree).
3. Dimensions D1 and E1 do not include mold flash protrusions or gate burrs.

| DIM. | MILLIMETER | | |
|----------|------------|------|------|
| | MIN. | NOM. | MAX. |
| A | 0.90 | 1.00 | 1.10 |
| b | 0.31 | 0.41 | 0.51 |
| c | 0.20 | 0.25 | 0.30 |
| D | 5.00 | 5.20 | 5.40 |
| D1 | 4.95 | 5.05 | 5.15 |
| D2 | 4.00 | 4.10 | 4.20 |
| E | 6.05 | 6.15 | 6.25 |
| E1 | 5.50 | 5.60 | 5.70 |
| E2 | 3.42 | 3.53 | 3.63 |
| e | 1.27BSC | | |
| H | 0.60 | 0.70 | 0.80 |
| L | 0.50 | 0.70 | 0.80 |
| K | 1.23 REF | | |
| θ | - | - | 10° |

Recommended Soldering Footprint


DIMENSIONS: MILLIMETERS